

Prevalence of Type of Partial Edentulousness among the Population of Bhotenamlang, Sindhupalchowk, Nepal: An Observational Study

Dilesh Pradhan¹, Lajana Shrestha², Siddharth Dixit³, Amrita Shrestha⁴

^{1, 2, 3, 4}Kathmandu Medical College Public Limited, Kathmandu, Nepal

Abstract: ***Background:** Edentulism (partial or total) is an indicator of the oral health of a population. The objective of this study was to assess prevalence of type of partial edentulism based on Kennedy's classification among the population residing in Bhotenamlang, Sindhupalchowk, Nepal. This study also evaluated knowledge about dental prosthesis and the principal cause for loss of teeth among the study participants. **Method:** Formulated closed ended questionnaire was made and convenient sampling technique was used for sample selection. 250 patients participated in the oral health screening program and 160 were partially edentulous. 128 participants fall on our inclusion criteria (participants age 15 years and above). After explaining nature of the study to participants, written informed consent were taken and structured questionnaire was filled up by the examining doctor. Education, pernicious oral habit, reason for loss of tooth and prosthetic rehabilitation were the individual variables accessed. Data obtained was entered and analyzed by IBM SPSS Statistics Version 20 software and statistical analysis was done. **Results:** Kennedy's Class III partially edentulous condition was most prevalent among the participants in both upper (43.8%) and lower (52.3%) arch. Caries alone (45.3%) was the most common reason for tooth loss. Edentulism in upper arch was found to be inversely correlated to education levels of the participants. **Conclusions:** Kennedy's Class III was the most prevalent partially edentulous condition. Almost every participant knew about the different treatment modalities of partially edentulous condition but lack of proper center for dental care, poor socioeconomic conditions and high illiteracy rates were main factors restricting them from getting proper treatment. Conducting oral health outreach programs is one of the many necessary steps that need to be taken to improve oral health status of the population. It will provide adequate data on oral health status of the population which will serve as a basis for formulating future oral health programs and policies.*

Keywords: Edentulousness, Partial edentulism, Kennedy's Classification

1. Introduction

Edentulism (partial or total) is an indicator of the oral health of a population [1]. It is a debilitating and irreversible condition and is described as the "final marker of disease burden for oral health" [2]. This condition still remains a major form of disease worldwide, especially common among old age group [3]. Many studies have shown that this condition is closely associated with various factors like education, socio-economic status, lifestyle and also belief and attitude towards dental care [4][5] and is more prevalent in poor populations and among women [6][7]. Complete/Partial edentulism is increasing in developing countries and the reasons commonly cited in literature are periodontal diseases and caries [8].

Glossary of Prosthodontic terms defines Prosthodontics as a dental specialty pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of the oral function, comfort, appearance and health of patient with clinical conditions associated with missing or deficient teeth and/or maxillofacial tissues using biocompatible substitutes. Dental Prosthesis is an artificial replacement (prosthesis) of one or more teeth (up to the entire dentition in either arch) and associated dental/alveolar structures [9].

Literature review on edentulousness among Nepalese population is very scanty [10]. Previous study has mainly focused on the urban population and rural population is yet to be explored.

This study was done in Bhotenamlang, Sindhupalchowk. This area was severely hit by the earthquake back in 2015.

Although this place is approximately 70 kilometers from Kathmandu (Capital of Nepal), poor road conditions and unavailability of proper health care center makes the life of people living there very difficult.

The main objective of this study was to assess the prevalence of type of partial edentulism among the population residing in Bhotenamlang, Sindhupalchowk, Nepal. This study also aimed to find out the principal cause for the loss of teeth, assess their knowledge about dental prosthesis and correlate this with their educational status.

2. Method

After approval from the Institutional Review Committee, this observational study was carried out at Bhotenamlang, Sindhupalchowk, Nepal. Formulated closed ended questionnaire was made based on similar kind of study done earlier [10] and necessary modifications were made according to our study need which was tested and validated. Non probability based purposive convenient sampling technique was used for sample selection. 250 patients participated in the oral health screening program and 160 were partially edentulous. 128 participants fall on our inclusion criteria (participants age 15 years and above). After explaining the nature of the study, written informed consent were taken from the participants and the structured questionnaire was filled up by the examining doctor himself/herself. Full mouth examination was done with mouth mirror and explorer using torch for light source when needed. One investigator and one recorder were involved for data collection. A predetermined format for questioning was followed in order to eliminate the interviewer bias.

Volume 6 Issue 9, September 2017

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

Education, pernicious oral habit, reason for loss of tooth and prosthetic rehabilitation were the individual variables accessed.

The partially edentulous participants were categorized using Kennedy's and Applegate – Kennedy's Classification[11]. The data obtained was entered and analyzed by using the software IBM SPSS Statistics version 20 and descriptive and inferential statistics were performed.

3. Results

Out of 128 participants who met the inclusion criteria 65 were males and 63 females. 62 participants had partial edentulism in both arches and 66 participants were edentulous only in one arch. Partial edentulism was categorized for both upper and lower arches based on Kennedy's classification and 43.8% (n = 56) were found to be class III followed by class I (15.6%), class II (7.8%) and class IV (5.5%) respectively for upper arch.

Table 1: Frequency Table, Kennedy Classification of Upper Arch

Kennedy Classification	Frequency	Percent
Not Applicable	35	27.3
Kennedy class I	20	15.6
Kennedy Class II	10	7.8
Kennedy Class III	56	43.8
Kennedy Class IV	7	5.5
Total	128	100.0

Likewise 52.3% (n=67) were class III for lower arch followed by class I (15.6%), class II (7.0%) and class IV (0.8%) respectively.

Table 4: Correlation between edentulousness, food and oral habits and demographic factors

Variables	Edentulous Upper arch	Edentulous Lower arch	Food habits	Oral habits	Sex	Education
Edentulous Upper arch	1	-	-	-	-	-
Edentulous Lower arch	-0.347*	1	-	-	-	-
Food habits	0.057	-0.020	1	-	-	-
Oral habits	-0.057	-0.037	-0.43	1	-	-
Sex	-0.027	0.082	0.118	0.267*	1	-
Education	-0.371*	-0.037	-0.06	-0.008	-0.136	1

* Significance, $p < 0.05$

4. Discussion

In our study, the prevalence rate of partial edentulism among the total number of participants was 64% and Kennedy's class III was more common in both upper and lower arch followed by class I, class II and class IV in decreasing order. This result finds similarity with the study done previously [12][13]. But in contrary with the same study done by Sapkota et al[12], we found class III more common in mandibular arch than maxillary arch.

Caries alone (45.3%) was the most prevalent conditions for tooth mortality in the present study. Only 6% pointed periodontal disease causing tooth loss. Caries and

Table 2: Frequency table, Kennedy classification of Lower arch

Kennedy Classification	Frequency	Percent
Not applicable	31	24.2
Kennedy class I	20	15.6
Kennedy class II	9	7.0
Kennedy class III	67	52.3
Kennedy class IV	1	.8
Total	128	100.0

The reason for loss of tooth was mainly associated with caries (45.3 %, n=58). Periodontal reasons and trauma were found to be secondary. Congenitally missing teeth was found to be minimal (2.3%, n=3).

Table 3: Reasons for loss of teeth among the study population (n=128)

Reasons	Frequency (%)
Congenital Missing	3 (2.3)
Caries	58 (45.3)
Periodontal	6 (4.7)
Trauma	13 (10.2)
Other	2 (1.6)
Caries and Periodontal	26 (20.3)
Caries and Trauma	14 (10.9)
Caries, Periodontal and Trauma	6 (4.7)

Out of total number of partially edentulous participants, 43% (n=55) were wearing some form of dental prosthesis among whom 23.9% (n=11) were illiterate and 36.08% (n=44) received education. Lack of availability of proper center was found to be most prevailing factor restricting them (38.4%, n=28) from not having any form of prosthesis.

Correlation values indicated that edentulism in upper arch was inversely proportional to education levels of the participants ($r=-0.371$, $p=0.000$) and males were more prone towards pernicious oral habits ($r=0.267$, $p=0.002$).

periodontal disease was the next more frequent reason for multiple tooth loss (20.3%). Other reasons included trauma (10.2%) and intentional extraction of teeth due to malpositioning (1.6%). Our result agrees with other study done in Nepalese population[14] and beyond [15][16] which also shows caries to be the major cause of tooth loss.

Correlation values shows edentulism in upper arch decreases with increase in patient education level. This is consistent with the study[10] done previously in Nepalese population. In our study, out of total participants, 46 (35.9%) were illiterate among whom 35 participants (76.1%) were not wearing any prosthesis. When asked for the reason, only 1 participant (2.2%) didn't know anything about any form of

prosthesis and rest of them were not wearing due to unavailability (39.1%) and financial problem (26.1%). From those who were wearing prosthesis, 12 participants (21.8%) were wearing faulty prosthesis (cold cure acrylic dentures fixed to their teeth). This shows that they are aware of the importance of teeth and want the dental prosthesis but lack of proper center and poor socioeconomic conditions is restraining them from availing it. Our result shows similarity with the study done by Bushranaaz et al[17].

Male were more prone towards pernicious oral habits ($r=0.267$, $p=0.002$) compared to female. Among participants who were illiterate, 67.5 % ($n=31$) were associated with some type of pernicious oral habit like smoking (10.9 %), alcohol consumption (19.6%) or both (37%). Participants who had done primary schooling and/or higher studies are comparatively less inclined to these habits.

5. Conclusions

Kennedy's Class III partially edentulous condition was most prevalent at the area where we conducted our study. Almost everyone among our participants knew about the different treatment modalities of partially edentulous condition but lack of proper center for dental care in the vicinity, poor socioeconomic condition and high illiteracy rate are main factors restricting them from getting proper treatment.

References

- [1] Brodeur JM, Benigeri M, Naccache H, Olivier M, Payette M. [Trends in the level of edentulism in Quebec between 1980 and 1993]. *J Can Dent Assoc.* 1996;62:159–60, 162–6.
- [2] Cunha-Cruz J, Hujoel PP, Nadanovsky P. Secular trends in socio-economic disparities in edentulism: USA, 1972-2001. *J Dent Res.* 2007;86:131–6.
- [3] Douglass CW, Shih A, Ostry L. Will there be a need for complete dentures in the United States in 2020? *J Prosthet Dent.* 2002;87:5–8.
- [4] Müller F, Naharro M, Carlsson GE. What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe? *Clin Oral Implants Res.* 2007;18:2–14.
- [5] Shabana Begum S, Reddy VcS, Kumar RVSK, Sudhir K, Srinivasulu G, Noushad Ali S. Tooth loss prevalence and risk indicators among adult people visiting community health centers in Nellore district, Andhra Pradesh: A cross-sectional study. *J Indian Assoc Public Heal Dent.* 2016;14:413.
- [6] Millar WJ, Locker D. Edentulism and denture use. *Heal reports.* 2005;17:55–8.
- [7] Bedos C, Brodeur J-M, Boucheron L, Richard L, Benigeri M, Olivier M, et al. The dental care pathway of welfare recipients in Quebec. *Soc Sci Med.* 2003;57:2089–99.
- [8] Odusanya SA. Tooth loss among Nigerians: causes and pattern of mortality. *Int J Oral Maxillofac Surg.* 1987;16:184–9.
- [9] Terms TG of P. The Glossary of Prosthodontic Terms. *J Prosthet Dent.* 2017;117:e1–105.
- [10] Basnyat SKC, Sapkota B, Shrestha S. Epidemiological survey on edentulousness in elderly Nepalese population. *Kathmandu Univ Med J.* 2014;12:259–63.
- [11] Ulmer FC. Kennedy-Applegate classification of partially edentulous dental arches. *NADL J.* 30:37–40.
- [12] Sapkota B, Adhikari B, Upadhaya C. A Study of assessment of partial edentulous patients based on Kennedy's classification at Dhulikhel Hospital Kathmandu University Hospital. *Kathmandu Univ Med J.* 2013;11:325–7.
- [13] Bharathi M, Babu KRM, Reddy G, Gupta N, Misuriya A, Vinod V. Partial Edentulism based on Kennedy's classification: an epidemiological study. *J Contemp Dent Pract.* 2014;15:229–31.
- [14] Dixit LP, Gurung CK, Gurung N, Joshi N. Reasons underlying the extraction of permanent teeth in patients attending Peoples Dental College and Hospital. *Nepal Med Coll J.* 2010;12:203–6.
- [15] Jovino-Silveira RC, Caldas A de F, de Souza EHA, Gusmão ES. Primary reason for tooth extraction in a Brazilian adult population. *Oral Health Prev Dent.* 2005;3:151–7.
- [16] Kumar, Chandrasekaran S, Prabhu NK, Mahesh R. Indian Journal of Multidisciplinary Dentistry. *Indian Journal of Multidisciplinary Dentistry;* 2017.
- [17] Jaleel BF, Nagarajappa R, Mohapatra AK, Ramesh G. Risk indicators associated with tooth loss among Indian adults. *Oral Health Dent Manag.* 2014;13:170–8.